PFD creation made easy

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White Paper

Process engineering with COMOS FEED

Summary
Efficient use of time during the planning phase is a decisive factor in reducing costs. In the early conceptual phase, the creation of the process flow diagram, in particular, takes up a great deal of the design engineer's time. These process flow diagrams which a plant engineer creates for different plants are often very similar in many points. The COMOS FEED software solution allows to copy process flow diagrams that have already been created, modify them and reuse them for a new project (PFD Reuse).

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Efficiency in the FEED phase

Efficiency is indispensable during the front-end-engineering- and design phase (FEED phase). During this phase, the initial cost calculations are made based on a preliminary assessment of all delivery items. The results form the basis for binding cost estimates and represent a guideline for the basic engineering. The process flow diagram (PFD) is the most important planning document of this FEED phase. However, creating the PFD often demands a lot of time. Objects need to be defined, streams positioned and their direction determined. Added to this, various additional graphics need to be integrated. The process flow diagrams of a plant engineer, however, are often the same in many points. In different plants of the company, for example, the specifications of individual components are often very similar. Processes that have proved themselves in older projects are often also required in a new project. Even during plant reconstruction, the various process flow diagrams usually only differ from each other in minor details. The design engineer can therefore save a considerable amount of time if data from earlier PFDs can be reused either in their entirety or partially, making use of as much knowledge as possible from an existing process in the new project.

Simply copy and reuse process flow diagrams

The PFD reuse tool in COMOS FEED facilitates the reuse of existing PFDs as the basis for plant engineering. Entire existing process flow diagrams or parts of them can therefore be used for the planning or reconstruction of plants. The individual process engineering specifications of a current project are simply redefined. This means that the entire basic engineering does not need to be created again from the beginning for each individual project. The copy of an old process flow diagram is simply modified. This reduces the likelihood of errors and shortens the time needed by the planning engineer during this phase.

Simple editing of copied process flow diagrams

To reuse a process flow diagram in COMOS, a project that strongly resembles the new plant is first selected from plants that have already been implemented. The PFD of this old project is copied. This means that the entire graphics, including the corresponding data and links of an old process flow diagram, can be transferred to a new project. This procedure is particularly suitable for reconstruction plans. In this case, the last version of the PFD of the relevant plant or plant section often only needs to be slightly modified.

The other possibility for PFD reuse is to copy only the graphic of the process flow diagram of an existing project to a new project. The symbols of the graphic are then automatically assigned to the objects newly defined earlier and to suitable data and links. This is, however, possible only if the newly defined objects have the same name as the corresponding symbols and objects in the old project. As a result, for example, containers, columns or streams are placed directly at the right point on the new, copied process flow diagram. Symbols from the old PFD for which there is no directly assignable data in the new project are shown in red on the process flow diagram of the new project (see also Figure 1). The design engineer can decide individually whether the object data and links from the old project also apply to the symbol in the new project and whether they should be copied and assigned accordingly. The data transfer can take place both for individual objects as well as for several PFD objects together. It is also possible not to assign any data to a symbol of the new PFD for the time being. You can still make the decision later whether the symbol should be deleted or whether it will be defined manually or, for example, by importing a simulation. It is, of course, no problem to add symbols and corresponding data to the new process flow diagram. All symbols for which objects with data and links were defined are displayed by COMOS on the new process flow diagram with black lines.

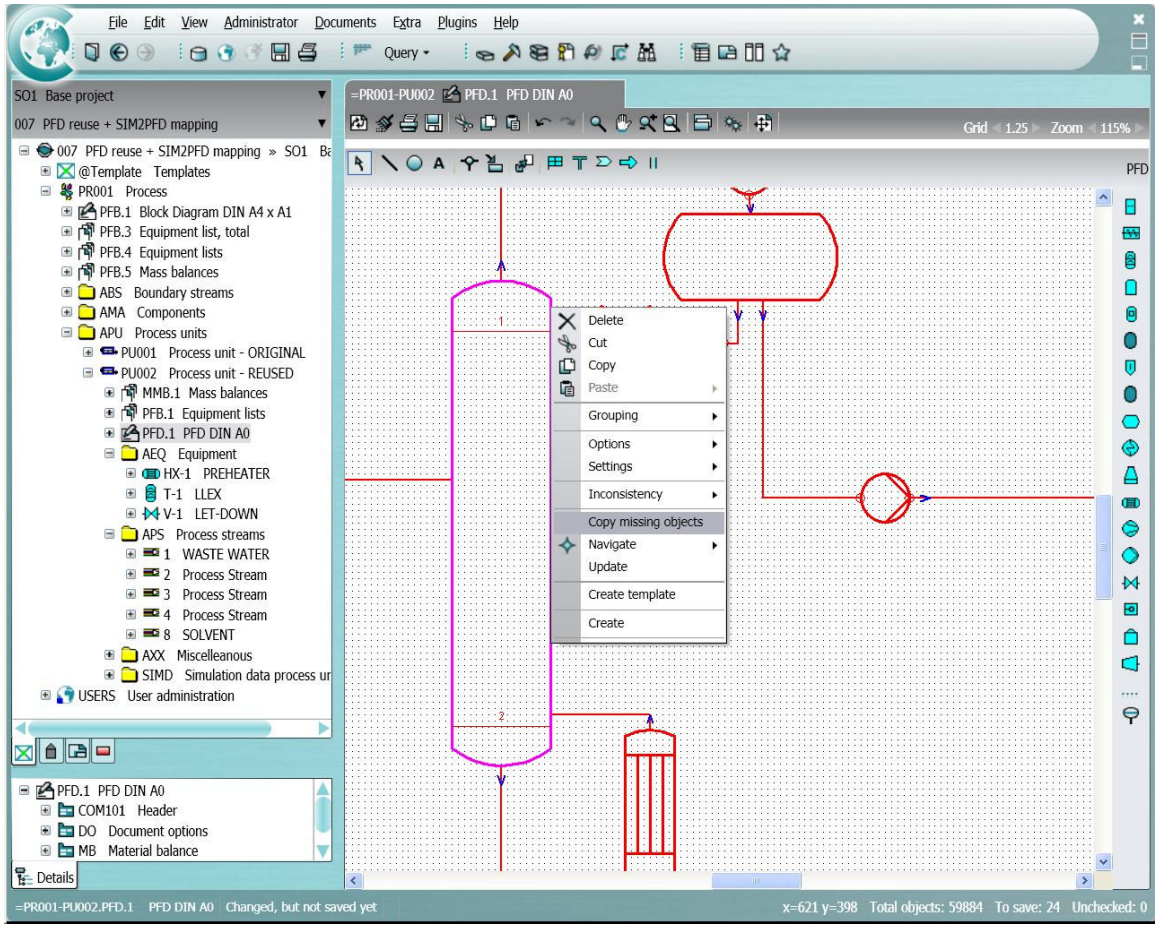

Figure 1: Symbols without assignable data in the new project shown in red.

Proven basis for new projects

By reusing a process flow diagram, all relevant and reusable information of an existing plant is available to the design engineer in a new project. The engineer does not need to perform the laborious task of specifying all objects individually, but can simply continue to work with a newly generated process flow diagram that already contains a lot of useful information and adapt it individually to the requirements of the new project. By reusing a PFD, the likelihood of errors and the effort required by the design engineer overall during the FEED phase are considerably reduced.

Technical implementation of PFD Reuse

The reuse of a PFD in COMOS is made possible by the technology of object orientation. An existing component is described thereby holistic and in its true-to-life graphical representation. During the planning phases, the interaction of different disciplines presents an entire, hierarchical component model. Subobject structures allow a realistic representation of the structure.

SIM2PFD mapping

In addition to PFD reuse, COMOS provides the option of replacing the data of the objects of a copied process flow diagram with new data from a simulation. With the SIM2PFD mapping technology, the design engineer can simply link the symbols of a PFD in COMOS with the data from a simulation program. This makes it possible to create the simulation and the process flow diagram at the same time during engineering. The classic method of planning the simulation first and afterwards the PFD does not necessarily need to be kept to. This reduces waiting and coordination times and a basis for meaningful offers is available much earlier.

Conclusion: Efficient PFD creation saves time and costs

Existing process flow diagrams can easily be copied and reused with COMOS FEED. They thereby form a valuable basis for planning new plants, taking into account the specific process engineering requirements of a new project. Efficiency during the early conceptual design phase is increased significantly. Data and components do not always have to be laboriously newly defined and specified for a new plant. This considerably reduces the risk of errors and increases the quality of the plant data. The overall time required by the design engineer and therefore the costs for the company involved are reduced during the FEED phase. Cost calculations and offers can be created earlier, significantly increasing the chances of winning against the competition.

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